Gold Nanoparticles Conjugation Kit-Thiolated Aptamers
PRODUCT DATA SHEET

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Description

Targeted delivery is one of the great challenges for effective cancer therapy. Effective targeted drug delivery systems are needed to improve the therapeutic efficacy of chemotherapy drugs. Introduction of active targeting moieties (e.g., antibodies, folic acid, and cancer-targeting peptides) has allowed for enhanced delivery of therapeutic agents to target tissues/cells. Among various active targeting moieties, aptamers that bind to a variety of biological targets have emerged as new targeting moieties with high specificity for targeted cancer therapy.

Abvigen Gold Nanoparticles Conjugation Kit-Thiolated Aptamers have been optimized for high efficiency one-step conjugation of thiolated aptamers directly to the gold surface of particles with diameters up to 100 nm. The kit contains ready-to-use pre-made mixtures. No activation, manipulation, or time consuming "salt-aging" steps are require for conjugation. Simply mix your reduced thiol-modified aptamer with the pre-activated gold nanoparticles supplied with the kit. Conjugation of the aptamer is achieved by the formation of a strong and stable gold-thiol bond without any additional linkers.

Kits are available in convenient 3 or 10 small-scale reaction formats allowing multiple to be conjugated simultaneously. The precisely engineered gold surface on our aptamer gold nanoparticles results in high conjugation efficiency and stable conjugates while minimizing non-specific binding in your assay.

For custom sizes, formulations or bulk quantities please contact our customer service department.

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Characteristics

Gold surface: Aptamer

Core diameter: Available with diameters from 5 nm ~ 100 nm

Optical density (OD): OD=2 when the contents of each vial is dissolved to a final volume of 1 ml.

Features & Benefits

Allows conjugation of aptamers to gold nanoparticles with sizes between 5 nm ~ 100 nm.

Fast and convenient one-step conjugation reaction with no pre-activation requirements or manipulation of the gold nanoparticles.

No time-consuming “salt-aging” procedures.

Results in a thiol-aptamer conjugated directly to the gold surface without any linkers.

Optimized for use in aptamer or aptamer/antibody based lateral flow applications.

Procedure

Reduction of thiol-modified aptamers (e.g. trityl-S-S-aptamers)

1. Prepare a 0.15 M sodium phosphate buffer, pH 8.5 supplemented with 0.1 M DTT.

Note: pH is important for proper reduction of aptamer.

2. Dissolve lyophilized aptamer to a final concentration of 500 µM in H_2O.

3. Mix 50 µl of dissolved aptamer with 450 µl sodium phosphate buffer.

4. Incubate 1-2 h at room temperature to reduce aptamer.

5. Separate reduced aptamer from trityl-SH and DTT using a NAP 5 column operated in H_2O, GE Healthcare.

6. Final eluate from NAP 5 column will be 1 ml in H_2O with an approximate concentration of 25 µM.

Note: Exact concentration of final eluate can be measured with UV-VIS spectroscopy by measuring the absorbance at 260 nm.

Conjugation of thiolated aptamer to Aptamer gold nanoparticles

1. Resuspend one vial of lyophilized Aptamer gold nanoparticle with 740 µl of H_2O.

2. Transfer into a 1.5 ml microcentrifuge tube.

3. Add 160 µl of reduced thiolated aptamer at 7.5 µM (0.0075 nmol/µl)* in H_2O as prepared above and incubate for at least 1 h at room temperature.

*Note: 7.5 µM aptamer is a good starting concentration, but if aggregation or poor sensitivity is observed, the following aptamer concentrations can be attempted for a given particle size range (based on a 30nt aptamer):

Particle size (nm)	5	10	15-70	80-100
[aptamer] (µM)	5-50	1-10	5-15	1-10

4. Add 100 µl of 1 M NaCl.

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5. Incubate for at least 1 h at room temperature to allow binding of the aptamer to the gold surface.

Note: Longer incubation times may improve surface coverage.

6. Centrifuge at the appropriate speed for your particular gold nanoparticle size (see table I) for 30 min to pellet your aptamer gold conjugate.

7. Remove supernatant.

8. Resuspend conjugate in 200 µl of storage buffer.

The optical density of the particles should be 10 if a 100% recovery has been achieved.

Common storage buffer: 10 mM sodium phosphate buffer, pH 7.0, 100 mM NaCl and 0.01% (w/v) NaN_3.

9. Measure optical density with a spectrophotometer and adjust concentration as desired.

10. Store conjugate at +4°C.

Table I. Appropriate G forces for centrifugation of gold nanoparticles. Note that recommended conditions are for a volume of 1 ml and centrifugation using a microcentrifuge, except for 5 nm gold nanoparticles that require an ultracentrifuge.

Size (nm)	Speed (g)	Time (min)
5	100,000	30
10	17,000	60 (~50% recovery)
15	17,000	30
20	6,500	30
30	4,500	30
40	2,500	30
50	2,000	30
60	1,125	30
80	600	30
100	400	30

Storage

Store at -20°C. Stable for at least 3 months if stored as specified.

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Note

This product is for R&D use only, not for drug, household, or other uses.

Ordering Information

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